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JUL 06 2006

REMARKS

Claims 26-30 and 32-46 are pending herein. Claim 26 has been amended to incorporate the subject matter of claim 31.

Claims 26 and 28-46 were rejected under § 103 over Vaidya et al in view of Iijima et al. This rejection is respectfully traversed for the following reasons.

The claimed invention is drawn to a process for deposition of a coating on an HTS tape, which includes, among other features, depositing the coating on the substrate as it translates along a substrate block. Of particular significance, the process calls for injecting gas through gas channels of the substrate block and onto the substrate during the process. The coating is a buffer layer over which an HTS layer is formed, the buffer layer having a biaxial texture. Applicants particularly point out that according to the claimed invention, the use of gas injection during the deposition process is responsible for notable and measurable improvements in the final product. That is, Applicants have discovered that in the particular context of forming a coating of an HTS tape, the resulting coating in the form of a buffer layer has *improved* biaxial texture. To clarify such improvement, the subject matter of claim 31 has been incorporated into claim 26, reciting that the buffer layer has an average texture of at least about 3° less than a buffer layer formed under identical process conditions except the injection of gas through the substrate block. In this respect, the improvement is clearly shown in, for example, Fig. 4, which plots direct injection of oxygen through the cooling block versus injection of oxygen in the chamber background. Applicants also note that the quantified improvement in crystallographic texture is quite noticeable, and results directly in notably improved superconducting properties of the HTS layer that is formed to overlie the buffer layer.

The PTO has apparently relied upon Vaidya et al for disclosure of basic process features of a coating process. The disclosure of Vaidya et al is not at all directed to HTS tape formation, but is generically directed to deposition of metallic material such as cobalt-nickel alloys on a plastic substrate, which may find use for recording video and data. The PTO points to disclosure in Vaidya et al of air injection on a back side of the substrate, and teaching in Vaidya et al that the backside gas injection improves thermal coupling between the translating substrate and its support (substrate block) and reduces the coefficient of friction between the web and the support.

Since Vaidya et al nowhere disclose or suggest use of the claimed apparatus and disclosed process to form an HTS tape, the PTO has looked to Iijima et al to bridge the gap in teaching.

However, even if one were to modify the prior art references so as to utilize the apparatus of Vaidya et al for formation of an HTS layer, the references nowhere disclose or even remotely suggest the manifested improvement as discovered by Applicants, notably an improvement in crystallographic texture as noted above. Applicants submit that this feature is quite significant, and not expected by one of ordinary skill in the art in light of the teachings of the references. In addition, the references nowhere disclose or suggest injection of gas through channels of the substrate block and onto the substrate. In this respect, Applicants have discovered that direct injection of gas through the substrate block as compared to background injection is of notable importance and results in a measurable improvement in the buffer layer. Please refer to Fig. 4 referenced above. In this respect, at best, Vaidya et al disclose functional equivalency of upstream gas injection versus through the substrate block. Accordingly, it is quite clear that the references nowhere appreciate the significance of gas injection through the substrate block, let alone the manifested improvement in crystal graphic properties of the buffer layer.

For at least the foregoing reasons, Applicants respectfully submit that the present claimed invention would not have been obvious over Vaidya et al in view of Iijima et al. Accordingly, reconsideration and withdrawal of the § 103 rejection over those references are respectfully requested.


Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims.

Should the Examiner deem that any further action by the Applicants would be desirable for placing this application in even better condition for issue, the Examiner is requested to contact Applicants' undersigned attorney at the number listed below.

The Commissioner is hereby authorized to charge any fees, which may be required, or credit any overpayment, to Deposit Account Number 50-3797.

Respectfully submitted,

Date 7/6/06


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